



National Fallen Firefighters Foundation



Research Agenda for Firefighter Life Safety



National Fallen Firefighters Foundation



- Established by Congress 1992 to honor firefighters who die in the line of duty
- National Fallen Firefighters Memorial – Emmitsburg, MD
- Annual Memorial Weekend
- Family and Survivor Assistance Programs





Firefighter Life Safety Initiatives Project

16 Initiatives



Uncontrollable / Unpredictable Circumstances

Unknown / Unrecognized Hazard

Valiant Effort

Criminal Intent

Incorrect or Inappropriate S.O.P.s

Inadequate S.O.P.s

Lack of S.O.P.s

Medical Condition

Mental Condition

Lack of Effective Policies & Procedures

Unpredictable or Overwhelming Circumstances

Unprepared

Physical Fitness Deficiency

Lack of Training / Skills

Lack of Knowledge

Lack of Experience

Failure to Take Preventive or Regulatory Action

Lack of Resources

Failure to Identify &/or Analyze Risks

Inappropriate Risk Management Decisions

Failure to Manage the Situation

Systemic Failure

Inappropriate Behavior

Inadequate Management or Supervision

Failure to Provide Leadership or Supervision

Equipment Failure

Lack of Maintenance

Inadequate Support Systems

Freelancing

Failure to Follow S.O.P.s

High Risk Behavior

ROOT CAUSES



National Fire Service Research Agenda Symposium

June 1 - 3, 2005



Fire Service Culture



Attitudes and beliefs
that contribute to
high-risk behaviors and
resistance to changes



Operational Priorities



- Situational Awareness of Firefighter
Physiological and Environmental Conditions
- Fire Department Communications – Operability
- Fire Ground Factors that contribute to Injuries
and Fatalities
- Analysis of Live Fire Training Deaths and Close
Calls



Technology Issues



- Advanced Respiratory Protection
- PASS Failure Analysis
- Prevention of Firefighter Fatalities and Injuries involving Motor Vehicle Accidents



Health-Wellness-Fitness



- Firefighter Candidate Selection & Assessment
- Health Maintenance Program Evaluation
- Risk Factors Relating to Cardiovascular Disease



Health-Wellness-Fitness



- Physiological & Psychological Effects of Heat Stress
- Acute Physiological Response to Emergency Incidents
- Functional Capacity Evaluation & Testing



Information Management



- Data Access to the Information Infrastructure
- Technology to Support Incident Command
- Flashover and Structural Collapse Prediction



Special Studies

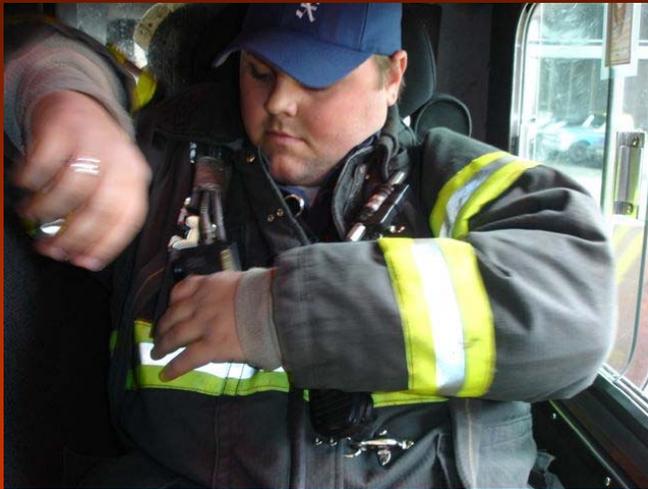


- Capture Data to Determine Firefighter Exposure to Fire Problems
- Target Fire Prevention and Public Education Efforts to Identified Problem Areas
- Criteria for the Evaluation of Public Education Programs
- Scientifically Based Community Risk Assessment Tool



**Why Don't Firefighters
Use Their Seatbelts?**











Firefighters Don't Fit in the Seats



The Seat has to Fit the Firefighter



Manual Anthropometric Measurement Project

(17) Shoulder Belt Length

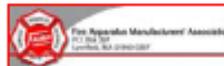
Start on the wall at the center of the shoulder.



End where the sitting surface meets the wall

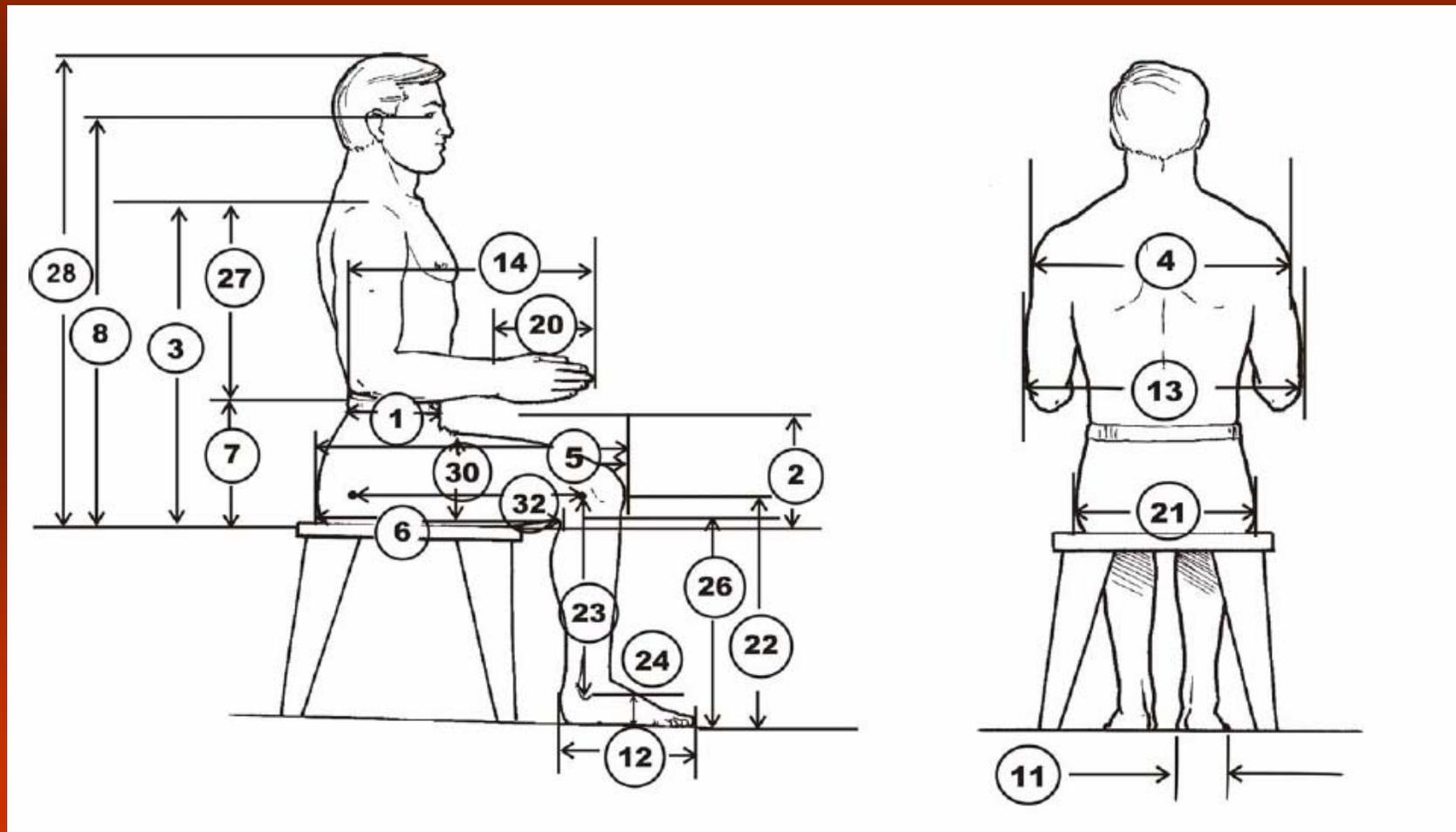


- Position subject sitting with back against the wall.
- Extend the tape from the wall at the shoulder, across the body, and ending where the sitting surface meets the wall.
- Record this measurement.





Traditional Anthropometric Measurement Techniques





5th – 95th percentile
Sitting Height

90%

5th – 95th percentile
Shoulder Ht, Sitting

82%

5th – 95th percentile
Functional Reach

78%

5th – 95th percentile
Bideltoid Breadth

71%

5th – 95th percentile
Buttock Knee Lth

67%



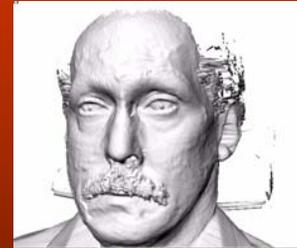
Full Body Surface Scanning



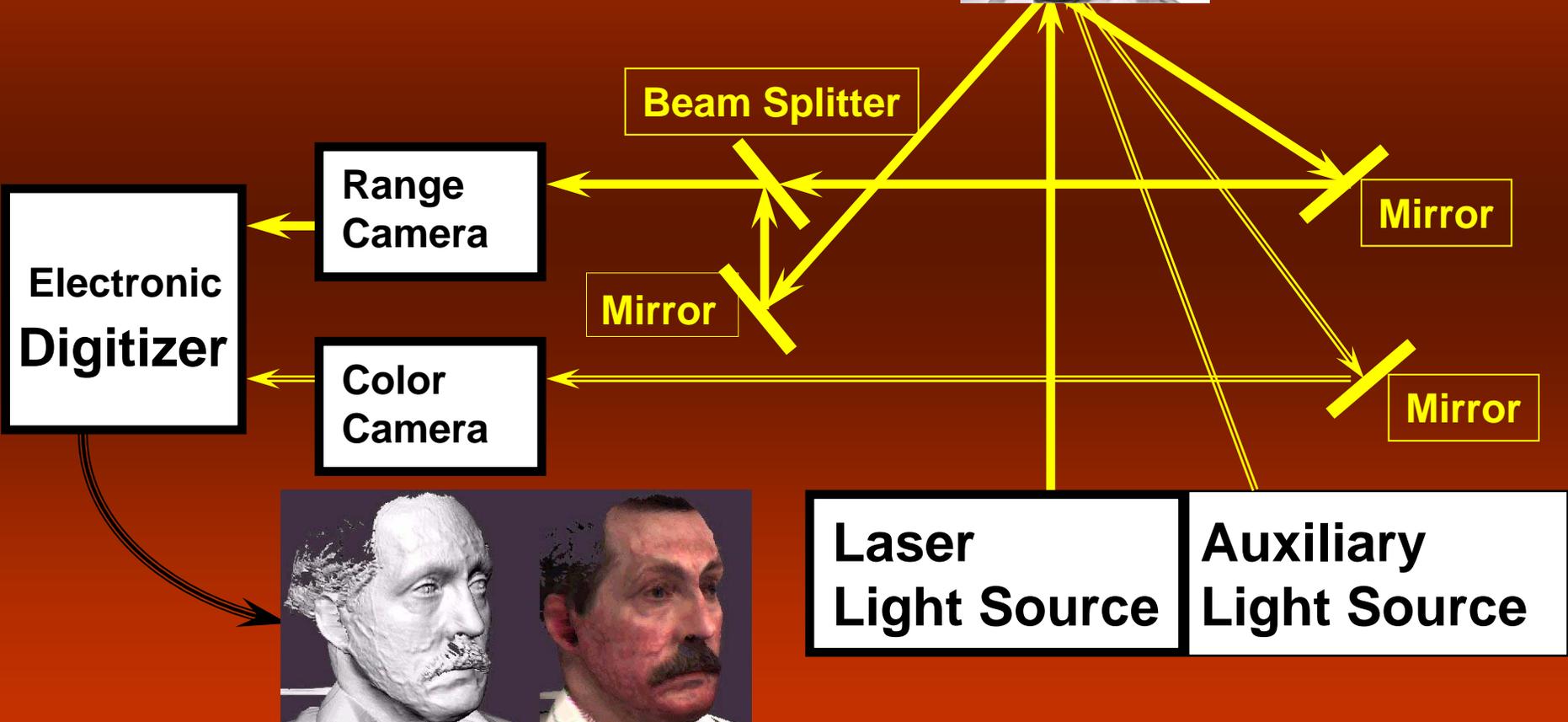
		shirt sleeve									
		2	3	3	3	3	3	3	3	3	3
		9	0	1	2	3	4	5	6	7	8
Sh i r t N e c k	13	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	13.5	0	0	0	1	1	0	0	0	0	n/a
	14	0	1	1	1	1	1	1	1	0	0
	14.5	1	1	1	4	6	7	5	2	1	1
	15	1	1	1	9	18	24	22	14	5	2
	15.5	0	1	3	10	29	55	63	32	18	6
	16	0	1	1	10	32	61	79	67	37	15
	16.5	n/a	1	1	5	19	39	62	64	37	20
	17	n/a	n/a	n/a	1	5	12	19	24	27	n/a
	17.5	n/a	n/a	n/a	1	1	2	4	9	n/a	n/a
18	n/a	n/a	n/a	n/a	1	1	1	2	n/a	n/a	



Surface Scanning

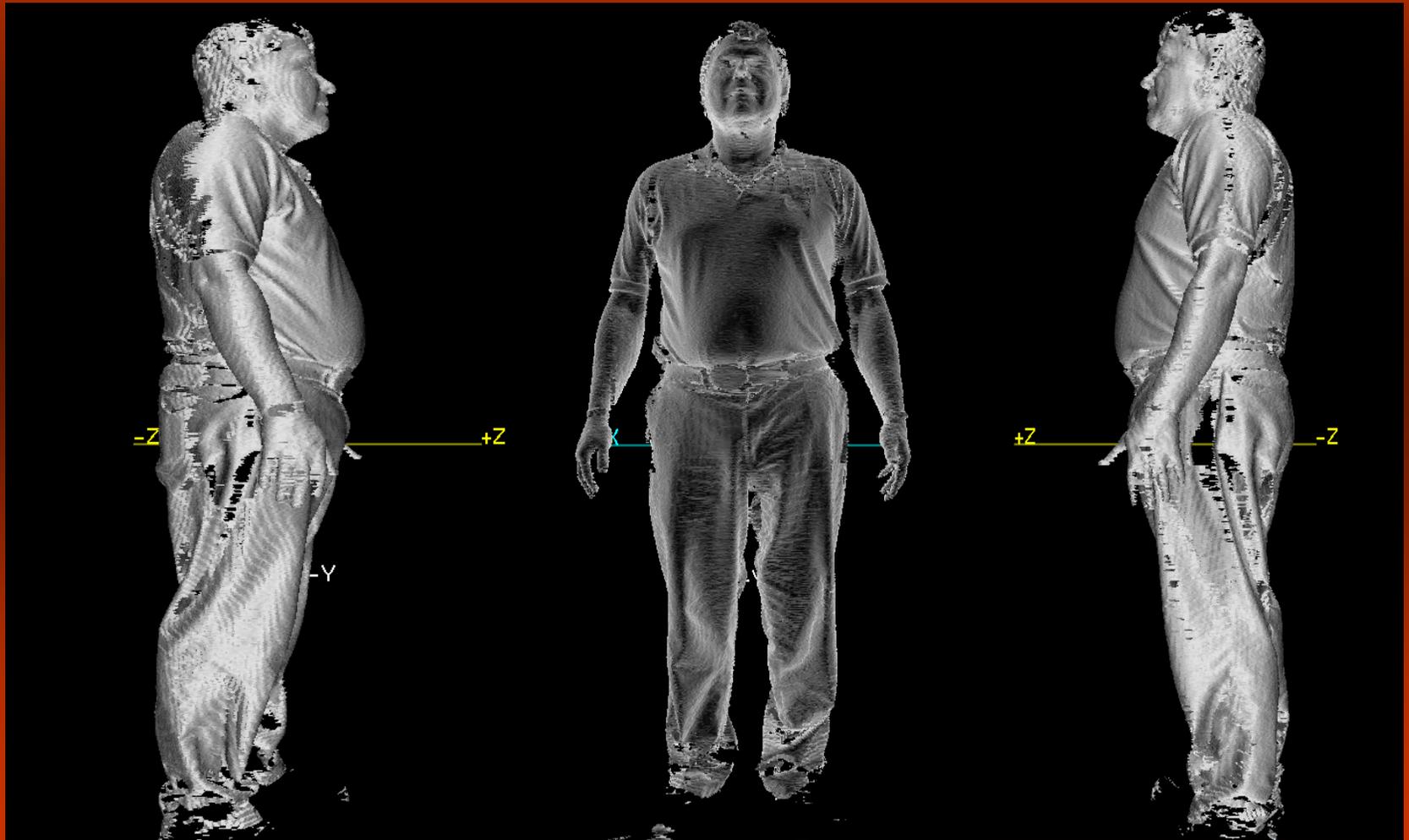


Subject



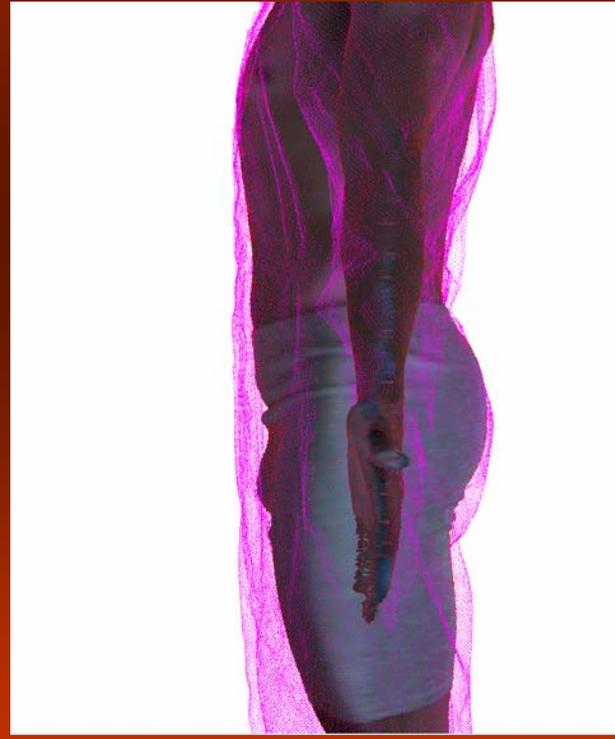
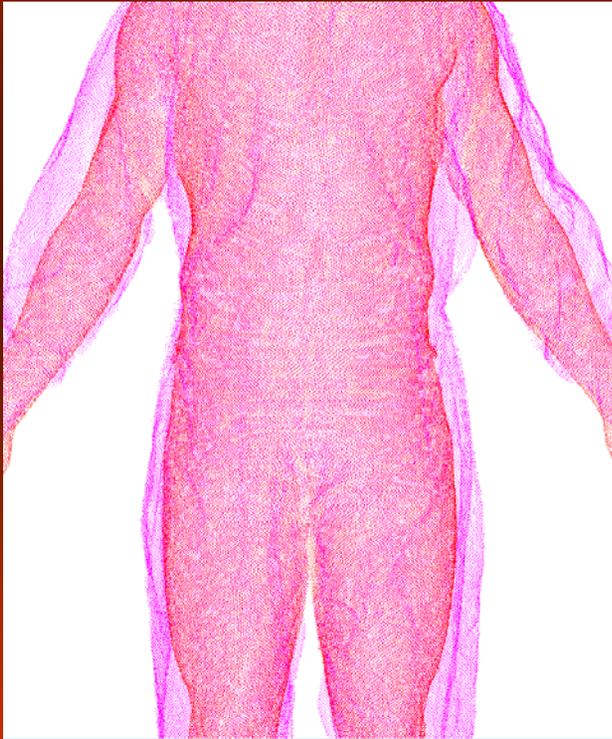
Visualization of Image Data













Potential Applications

- Fire Apparatus Seating
- Apparatus Design
 - Handholds
 - Ladder Rung Spacing
 - Step Height
- Protective Clothing
- Protective Equipment
- SCBA Facepiece Fit



Project Participants



- NFFF
- FAMA
- NIOSH
- NIST
- DHS
- USAF – WPAFB
- General Dynamics
- Total Contact Inc.

